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"The Peroxidase Reaction of Milk," by J. H. Kastle and M. B. Porch.

"The Effect of Castration on Metabolism," by Francis H. McCrudden.

"Experiments upon the Metabolism of Phosphorus in Man," by H. C. Sherman.

"On Turgor Pressure in Wounded Plant Tissues," by Herbert M. Richards.

"The Probability of a Radiotropic Response," by C. Stuart Gager.

"A Further Study of Solution Tension and Toxicity in Lipolysis," by Raymond H. Pond.

"Notes on the Chemical Nature of Egg Cases of Two Species of Sharks," by Louis Hussakof and William H. Welker.

"A Comparative Study of the Hydrolysis of Different Proteins in Pepsin-acid Solutions," by William N. Berg.

"Further Observations on Protein Salts," by William J. Gies.

"Further Studies on the Application of Folin's Creatin and Creatinin Methods to Meats and Meat Extracts," by A. D. Emmett and H. S. Grindley.

"The Determination of Ammonia in Meat and Meat Products," by F. W. Gill and H. S. Grindley.

"The Blood Clot of *Limulus*," by Carl L. Alsberg.

"On the Decomposition of Nucleic Acids by Nuclease," by Walter Jones.

Names of the Members Present at One or More of the Meetings.—John J. Abel, Carl L. Alsberg, Henry P. Armsby, A. E. Austin, Edwin J. Banzhaf, Silas P. Beebe, Harold C. Bradley, Russell H. Chittenden, Otto Folin, Robert B. Gibson, William J. Gies, H. S. Grindley, Howard D. Haskins, Philip B. Hawk, Lawrence J. Henderson, Reid Hunt, Holmes C. Jackson, Waldemar Koch, William F. Koelker, Arthur S. Loevenhart, John H. Long, Graham Lusk, Hugh McGuigan, A. B. Macallum, J. J. R. Macleod, Albert P. Mathews, Lafayette B. Mendel, Frederick G. Novy, Thomas B. Osborne, Mary E. Pennington, Oswald Schreiner, Victor C. Vaughan, Ralph W. Webster, H. Gideon Wells.

Abstract of the Executive Proceedings

Constitution.—A constitution, issued from the secretary's office several months prior to the meeting, and which had been provisionally approved by a vote of the members taken by correspondence, was formally ratified, and supersedes the

articles of agreement originally adopted for the government of the society.

New members—Edwin J. Banzhaf, Harold C. Bradley, Albert C. Crawford, Mary E. Pennington, Oswald Schreiner, Carl Voegtlin, Ralph W. Webster, Harvey W. Wiley.

Officers for the Year 1908-9:

President—John J. Abel.

Vice-president—Otto Folin.

Treasurer—Lafayette B. Mendel.

Secretary—William J. Gies.

Additional Members of the Council—A. B. Macallum, Albert P. Mathews, Frederick G. Novy.

Nominating Committee—S. P. Beebe, Francis G. Benedict, Reid Hunt, P. A. Levene, A. S. Loevenhart, John H. Long, Graham Lusk, Thomas B. Osborne, H. Gideon Wells.

Time and place of the next annual meeting were referred to the council, with instruction to determine both.

Report of the Committee on Protein Nomenclature. See "recommendations" to be printed in SCIENCE.

WILLIAM J. GIES,
Secretary

SCIENTIFIC BOOKS

In Wildest Africa. By C. G. SCHILLINGS. Translated by Frederic Whyte. With over 300 photographic studies direct from the author's negatives, taken by day and night, and other illustrations. Pp. xvi + 716. New York and London, Harper & Brothers. 1907.

It is safe to say that all who read Herr Schillings's first book on the African wilderness, called "With Flashlight and Rifle," or in its American edition "Flashlights in the Jungle," hoped to see more of his "nature documents," and to hear more of his unique experiences on the great velt of German East Africa. It is also safe to say that they will not be disappointed in the attractive volume "In Wildest Africa," which has recently appeared. In this work the author has added many side lights as well as "flashlights" to his theme—the vanishing fauna of the Dark Continent.

Herr Schillings's first volume, which I reviewed at some length in these columns,¹ was

¹SCIENCE, Vol. XXIII., April 6, 1906.

highly praised, as it deserved to be, both on account of the narrative which embodied the results of years of effort, and for the remarkable photographs which showed for the first time the big beasts of Africa as they really appear in the swamps, the mountains and upon the ever-changing velt. Naturally the first volume contained the best of the author's pictures, but the reader will find almost as large a fund of interesting materials in the second.

As Schillings remarks, the "twilight of the gods" long ago settled down upon the animals of South Africa and the Cape region, while now "an everlasting night is closing upon all the life and movement of the far away regions of the north and east," which he has attempted to describe. Probably the most remarkable fauna of the modern world, which the savage races handed over to the white man practically intact, and which they had inherited from a remote geological age—embracing such unique animals as the African elephant, the two-horned and white rhinoceroses, the hippopotamus, the lion and leopard, the zebra, not to mention the ostrich, the gnu and a great variety of antelope—is rapidly passing before the onslaughts of the traders in ivory and skins, and foreign sportsmen, the armed natives and the devastating Boers.

Schillings believes that all these great beasts and many smaller ones are destined to go with the advance of trade and the white settlements, and that in another century every skull, skeleton, and skin will be almost worth its weight in gold. The wilderness can not be patrolled, but let all nations cooperate in making and enforcing as far as possible effective laws, in establishing asylums and sanctuaries as game-preserves, in stocking our museums with all the material which the naturalist needs for zoological study, in learning the habits of these wonderful beasts before they have vanished, in securing drawings, measurements and especially photographs, true to wild nature, to hand on as a legacy to future generations. Thus might be expressed the thesis which the author eloquently defends.

The varied fauna of South Africa has all but vanished, as our author remarks, unsung

and unfamed, before any great master could put on canvas or in words its record for all time. "May," says he, "the master soon appear who will be able to give us a noble and true picture of the East Africa Nyika, in all its vast proportions." Many passages could be quoted to show that the desired "master" had arisen in Schillings himself. At any rate he has all the requisite enthusiasm, energy and desire for truth, combining indeed the resources of hunter, artist, explorer, naturalist and philosopher.

In reviewing the earlier work referred to, I spoke of the charm which a certain indistinctness lends to many of his photographs, suggesting the work of a painter like Corot. Others have noticed this and have compared some of his pictures of birds to the designs of Japanese artists. Schillings discusses this matter freely, and says that he was pleased to find that this unavoidable effect of the intense heat and dazzling light, or in some cases of the long exposure required for the telophoto lens, was not in all respects disadvantageous. In many cases it eliminates the hard and unnatural character of the photograph, and gives us true pictures, that is a series of superimposed surfaces, without lines of any kind, which have no place in nature. This is not to be confused with the blurred effect of objects in motion, and is objectionable only when greater detail is desired. As illustrations of this the reader should compare the picture of gnus and zebra resting under the shade of a tree (p. 241), a herd of black hoofed antelope on the edge of a forest (p. 217), and especially a large troop of zebra and gnus herded in the midst of foliage, which from a pictorial standpoint are extremely fine. As to birds, the silhouette of pearl hens in an acacia tree (p. 397), or even the picture of flamingoes on the wing (p. 253) could be effectively copied without change for an ornamental screen. The same comment would apply to admirable studies of giraffe seen stalking over the velt (p. 577) and to other subjects which could be mentioned.

Among the interesting facts recorded we note the following: The remarkable abundance of life which at the time of his visit existed in

some of the small lakes of the Kilimanjaro region, where hippopotami disported at as close quarters as in a zoological garden—to the observer, who was of course hidden; the only bird-song heard which suggested Europe was that of the African nightingale, the northern relative of which has been known to nest in Africa; seven pounds of stones and pebbles were taken from the stomach of a crocodile, and the author suggests that they are swallowed as an aid in sinking, but must these animals then regurgitate ballast whenever they wish to rise? The swamp-pools harbor an almost incredible number of fish, in spite of the hosts of fish-eating birds and crocodiles which prey upon them. Here no doubt is a great store of new and interesting material awaiting the ichthyologist. The elephants are not dependent upon grass, but will literally strip a tree of its bark or of its branches when hard pressed, and are sometimes found in company with the giraffe, the most timid of all the big animals, which never fights unless surrounded. The writer thinks that the okapi is certain to survive its larger relative. The largest tusks of the African elephant yet recorded came from German East Africa, weighed together 450 pounds, and were sold to an American for five thousand dollars. The rhinoceros not only occasionally breaks a horn, but sheds both of its ponderous weapons at intervals, whether in freedom or in captivity. The organ shrike, which sings under the blazing sun of midday, mates for life. The question is asked why the eyes of beasts of prey shine out in the darkness, and the author remarks that he has “never been able to get any precise scientific explanation of the phenomenon.” We supposed that the eyes of no animal ever shone in absolute darkness, and that the glistening so often seen and recorded by the camera was solely due to the interference of reflected light in that peculiar layer of the choroid coat called the tapetum lucidum, and which the eye of the cat or the dog illustrates as perfectly as that of a lion or hyena.

We share the writer's admiration for President Roosevelt, when he speaks of his efforts for the preservation of game in America, but

think he is in error when he adds: “The establishment of the Yellowstone National Park was largely the President's work,” since this park was dedicated in 1872, when our president was a lad of fifteen, and enlarged in 1891, or ten years before he entered the White House.

The destruction of wild animals, at first, no doubt, a necessity, seems to have become a confirmed habit if not a second nature of the Boers, their only contribution to zoology thus far being a lot of ugly and ridiculous names. Thus the gnu is called “wildebeest”; the cow-antelope “hartbeest,” because it is tenacious of life; the hyena was called the “wolf,” and the giraffe the “kameel”!

Herr Schillings was wont to resort to certain hilltops and tall trees from which, as from an observatory, he could watch the panorama of wild life unfold upon the plains. The numbers and variety of animals which sometimes passed under his eye were wonderful. He has drawn many striking pictures of the shifting scenes of this wilderness-drama, and the reader will enjoy his vivid descriptions of the velt under the changing lights, and the varying sounds of the forest at all times of the day and night.

In the two concluding chapters Schillings describes the difficulties of photography in a country in which water is often the greatest of all luxuries, as precious as life itself, even when obtained from small mud-pools, where everything “undulates and shimmers, bathed in a dazzling sea of light,” where light-colored objects often appear deep black, where distances are so deceptive that when but a few hundred paces away it is often impossible to distinguish a rhinoceros from an ostrich or the termites' nest, and where the labors of the night worker are usually rewarded by a fresh attack of malarial fever. In most of the cases of flashlight photography the animals were made to take their own pictures at favorite drinking pools, or around some bait or lure, by means of strings secured to upright stakes and to the camera. For success the flash must be powerful; it must be absolutely simultaneous with the exposure, and the right animal must fire the charge and come

into range in doing so. This may sound easy, but if so, the reader is likely to alter his opinion after reading Herr Schillings's interesting narrative. We should have omitted all the illustrations of "failures" of one kind or another, as quite unnecessary to the description of the methods.

The translation seems to be well done, and but few and trifling errors have been noticed. The moral of the work, like the matter of it is admirable, and may be expressed in brief—avoid all ruthless and unnecessary destruction of the beauties of nature wherever found!

FRANCIS H. HERRICK

Aposporie et Sexualité chez les Mousses. EL. and EM. MARCHAL. Bull. Ac. roy. Belg. Cl. Sciences, No. 7, pp. 765-789.

In a paper already reviewed in SCIENCE, the Marchals have shown that the individual capsules of certain dioecious mosses contain both male and female spores and that regenerations from the leaves, protonemata or from other parts of the gametophyte give rise to the same sex as the plant from which they were derived. In the present paper they give the results of a careful investigation by means of pure cultures of the sexual condition in the sporophytes of the dioecious mosses—*Bryum caespiticium*, *Mnium hornum* and *Bryum argenteum*. They find that regenerations from the capsule or from its stalk, *i. e.*, from any part of the sporophyte, give rise to bisexual protonemata from each of which are developed three types of leafy axes: (1) Those apparently male containing only antheridia, (2) those obviously hermaphroditic containing both antheridia and archegonia, (3) those apparently female containing only archegonia. Shoots with only antheridia were most common, those with both antheridia and archegonia were considerably less abundant while those with only archegonia were distinctly rare. That the three different types of shoots were potentially hermaphroditic was shown by regenerations from their leaves. These gave in repeated cultures of *Bryum caespiticium* approximately the same ratio of shoots apparently male, hermaphroditic and female as were

obtained directly by regeneration from the sporophyte and it is concluded that the hermaphroditic condition can be thus indefinitely propagated by vegetative means.

It may be pointed out that this transformation of a dioecious species of the mosses into an hermaphroditic growth brought about by the Marchals is similar to what the reviewer has already accomplished in essentially the same manner with the mould *Phycomyces nitens*. The hermaphroditic growth obtained from this species when propagated by cuttings retains its bisexual character often to a dozen or more vegetative generations but eventually the bisexual character is lost and with the disappearance of one sex, the growth is not to be distinguished from a pure unisexual race, male or female as the case may be. The hermaphroditic growths of the mosses resemble those of *Phycomyces* in that they differ in their sexual polarity. Thus while one regeneration from the sporophyte of *Bryum caespiticium* showed a marked male polarity and produced one shoot with antheridia and archegonia to 51 with only antheridia, a second regeneration from the sporophyte of this same species showed an equality of the sexes and of 21 shoots, produced 17 with archegonia and antheridia, 2 with only antheridia and 2 with only archegonia. In view of the behavior of *Phycomyces*, the Marchals seem hardly justified in concluding from an examination of only two generations that the hermaphroditic condition obtained in the mosses can be propagated for an indefinite period.

A determination of the chromosome number and the sexual conditions which result from the union of gametes arising from their artificially produced hermaphrodites is promised by the Marchals in the near future.

Mention of some unpublished work on the zygospores of *Phycomyces* may not be out of place in this connection. Zygospores formed by hermaphroditic growths of this species, which the reviewer has recently brought to germination, do not differ, in the sexual relations of the offspring to which they give rise, from zygospores formed between dioecious growths. It seems impossible therefore to fix